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# Going Beyond Compliance Fulfillment: A Literature Review on ESG Performance Management

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**Abstract.** Sustainability is increasingly entering a company’s activities. While the focus is still on ESG (external) reporting standards, in other words, being as compliant as required, we argue that an internal ESG performance management has the potential to achieve business value – beyond pure compliance fulfillment. However, literature reviews concerning a company’s internal ESG performance are underrepresented. Accordingly, we consolidate the current ESG literature threefold in terms of (1) structural and (2) process organization, as well as (3) supporting IS. By applying the Technology-Organization-Environment framework, we provide ten takeaways that cover main themes, research gaps, and avenues of future research.

**Keywords:** ESG, Sustainability, Performance Management, Green IS, Literature Review.

## 1 Introduction

Having suffered from the COVID-19 global pandemic, today’s economic environment is undergoing changes. Climate change stands out, thus, *sustainability* is increasingly entering the focus of a company’s activities [1].

The European Union [2] has established a set of environmental, social, and (corporate) governance (ESG) reporting initiatives. One example is the EU taxonomy, which specifies sustainability activities. Effective January 01, 2025, and therefore already relevant for the fiscal year 2024, the Corporate Sustainability Reporting Directive (CSRD) defines a *reporting framework for non-financial information* that extends both the group of affected companies and the ESG reporting content itself [3].

Focusing on the latter, more and more companies are making sustainability pledges, but far too few have so far worked beyond the ESG regulations and its (external) reporting [4]. Following a sound ESG vision, mission, and strategic program (including departments and roles) beyond pure compliance fulfillment, an (*internal*) *ESG performance management* should include threefold: (1) The redesign of the structural organization [5]; (2) an adjusted process organization including (internal) steering processes and resulting KPIs that are compliant with external regulations [6]; (3) supporting information systems (IS) that offer a central access for ESG metrics [7].

With regard to *literature reviews* in accounting, Tsang et al. [8] examined research on ESG disclosure, Gilian et. al [9] as well as Lombardi and Secundo [10] did so with an emphasis on ESG and corporate social responsibility (CSR). Ambec and Lanoie [11] focused on the costs and benefits for a company of being “green.” In IS research, Schoormann et al. [12] performed a systematic review on artificial intelligence (AI) for driving sustainability, Henkel and Kranz [13] reported on pro-environmental behavior and green IS, whereas Harnischmacher et al. [14] focused on green IS research streams.

All these articles focus on being as compliant as the external ESG perspective requires [15]. *Making a virtue out of a necessity*, we argue that (internal) ESG performance management has the potential to achieve business value – beyond pure compliance fulfillment. Hence, companies should not see new ESG requirements as a burden. Integrating sustainability into corporate management holds considerable opportunities.

However, we did not find a sufficient body of knowledge on how companies should apply the new ESG standards internally as a differentiator in the market. Accordingly, we present *takeaways from a literature review focusing on a company’s (internal) ESG performance management leveraging IS*. Analyzing a set of 64 publications, we aim to support companies willing to implement ESG performance management. For research purposes, we present main themes, research gaps, and avenues of future research.

Following Bandara et al. [16], we conducted a *systematic literature review (SLR)* as follows: Motivating this article by gaps in the current literature (*introduction*), we analyze related works (*theoretical background*). Then, we conduct a structured literature review (*review method*), present our findings by outlining several statistics of our data set (*descriptive results*) and identify main themes, research gaps, and avenues of future research (*critical appraisal*). Comparing our results with prior work and examining how they relate to the article’s objective, we close with a summary, limitations of our work, and avenues for future research (*discussion and conclusion*).

## 2 Theoretical Background

### 2.1 ESG frameworks

Starting with the capital market perspective on ESG, the *United Nations Principles of Responsible Investment (UNPRI)* is a framework for asset managers. It is a widely adopted ESG framework among US asset managers [17]. Its mission is to “[...] believe that an economically efficient, sustainable global financial system is a necessity for long-term value creation. Such a system will reward long-term, responsible investment and benefit the environment and society as a whole” [18].

The *United Nations 2030 Agenda for Sustainable Development Goals (SDGs)* focuses on improving human life. Presented in 2015, it consists of seventeen goals and 169 targets from all aspects of life. With the pledge that no one will be left behind, the participating countries agreed that all stakeholders should act as partners in a collective journey [19]. Focusing on companies, the *United Nations Global Compact* supports scaling the global collective impact with ten principles and delivering the SDGs to enable change by holding companies accountable [20].

According to the *Corporate Sustainability Reporting Directive (CSRD)*, companies that are already obliged to report on sustainability will have to report in greater detail in the future. Large but also mid-sized companies, regardless of their capital market orientation, will be required to prepare a sustainability report in the near future. In doing so, the European Financial Reporting Advisory Group (EFRAG) appointed drafts for the *European Sustainability Reporting Standards (ESRS)*, which are binding for all companies that have to prepare a sustainability report. Adopting the final standards as delegated acts in June 2023, the European Commission currently consults EU bodies and Member States on the draft standards [21]. Beyond and above Europe, the International Sustainability Standards Board (ISSB) approved two disclosure standards for companies, which reference the GRI and the ESRS [22].

The *ESG-ICE framework*, developed by the IS community, examines different ESG interactions [23]. It creates connections between the ESG dimensions and desirable outcomes for individual well-being, community welfare, and economic resilience (ICE) hierarchies, and opportunities by leveraging IS in human lives. The ICE hierarchies drive a community's well-being, which is part of broader economic resilience. However, the ESG dimensions are not mutually exclusive, and ESG components overlap. The authors of the ESG-ICE framework argue that "in [...] use cases involving this framework, it is often common to think of these elements as combinations." [23].

## 2.2 Performance management frameworks

While the ESG frameworks in Sect. 2.1 focus on the external perspective, this section focuses on a company's performance management. Management control systems (MCS) cover, beyond other approaches the COSO framework, activity-based management, and value-based management systems.

*COSO* refers to the Committee of Sponsoring Organizations of the Treadway Commission, comprising five global accountancy and auditing organizations. It published its first joint framework in 1992, called the Internal Control - Integrated Framework, which was continuously updated over time [24].

*Activity-based management (ABM)* enhances business efficiency by analyzing the profitability of every company segment using the approach of activity-based costing (ABC). According to the ABC theory, costs are consumed by activities, and activities are necessary to manufacture products [25]. While ABC supplies the information, ABM uses this information in various analyses for continuous improvement [26].

In contrast, *value-based management (VBM)* defines the company's value upon the analysis of its incoming discounted future cash flows. It examines how companies best use their cash flows to make both strategic and operational decisions. According to Copeland et al. [27], it aligns a company's overall aspirations, analytical techniques, and management processes to focus decision-making on the key drivers of value.

The *levers of control (LOC)* framework by Simons [28; 29] is most popular in MCS literature for the following reasons. It very well draws the connections between and contributes to the two fields of academia (through contingency theory) and practice (managing a company). At its core is the assertion, that companies are characterized by four levers of control: (1) Belief systems; (2) boundary systems; (3) diagnostic control

systems; (4) interactive control systems. To achieve a business strategy, they need to be balanced in the form of equilibrium. Since the initial publication [30–32], many studies have analyzed this framework, so that there is evidence for the assumption of interdependencies and the complementary nature of the four levers of control [33].

### 2.3 Hybrid frameworks

Combining the characteristics of ESG and performance management frameworks, this section covers hybrid frameworks. The *Sustainability Balanced Scorecard (SBSC)* is an extension of the BSC concept from Kaplan and Norton [34] and helps companies develop, implement, and measure their sustainability impact. In comparison to the original approach, which consists of four perspectives, that are (1) financial data, (2) customer/markets, (3) internal/processes, and (4) learning and growth, the SBSC adds another perspective on how to make the four existing dimensions more sustainable in terms of ecological and social aspects [35; 36].

The *Technology-Organization-Environment (TOE)* framework comprises technology, organization, and environment, as well as other areas within these dimensions [37]. It was initially applied to technology adoption but was subsequently used in various fields within IT. We emphasize the impact of the technological component of the TOE framework in our analysis while considering the organization and environmental aspects as well [38]. Focusing on the business-IT-alignment, we see IT support as the main driver in an increasingly digital business world.

Especially for sustainability analysis, data is the most crucial resource [39]. For instance, a cross-sectional field study focusing on the adoption of IS for sustainability reporting, allocated stand-alone sustainability IS, extensions of sustainability applications, and manual systems to the technology dimension. Furthermore, cost of implementation, managerial decision-making, type of (reporting) processes, complexity of requirements to the organizational dimension, compliance, external regulation, and documentation of records to the environment dimension [40]. Another model includes advantage, compatibility, and observability of technology. Furthermore, top management support, firm size, entrepreneurial orientation, and technological orientation for organization and competitive pressure, perceived trend, government support, and legal framework for the environment, were added [41].

### 2.4 TOE framework in focus

The ESG frameworks have a strong goal-orientation, i.e., they focus rather on what needs to be achieved and not how to manage changes. The LOC framework is appropriate for the internal perspective, but it lacks the outside view, i.e., the company's environment. The SBSC deals with this issue but refers to sustainability only as an improvement of existing dimensions, and not as a separate pillar.

However, the TOE stands out, as it is best to *analyze, sort, and classify different terms and approaches of prior publications*. This is due to its generalizability of dimensions and it also is flexible regarding subsequent focus areas. Accordingly, we take the

*TOE framework, including the focus areas given in Table 1, as our evaluation scheme for the ESG performance management body of knowledge.*

**Table 1.** Differentiation criteria regarding ESG performance management.

Dimension	Focus area	Characteristics	Source(s)
Technology	Type of application	Stand-alone, extension, manual solution	[40]
	Type of system	Belief, boundary, diagnostic control, interactive control systems	[28]
	Type of task	Automate, inform, transform	[42]
	Use case	Case optimizations, disclosure, green supply chain management, green strategies, IS adoption	[14]; [43]; [44]
Organization	Department	Executive board, management accounting, risk management, self-empowered	[35]; [36]; [40]
	Firm size	Group, SMEs, micro companies	[23]; [41]
	Management support	Executive board support, management support, no direct support	[23]; [41]
	Profit intention	Profit, non-profit	[18]; [19]; [45]
Environment	Competition	Leader, average, follower	[35]; [36]; [41]
	Driver	Regulation, standards, voluntary	[43]; [46]

### 3 Review Method

SLR is a method for studying a body of knowledge to develop insights, critical reflections, future research paths, and important questions [40]. They help to reduce the likelihood of bias and ensure identifying comprehensive knowledge on the chosen subject [41]. Documenting every step, *replicability* is ensured. Furthermore, systematic literature reviews help in overcoming challenges such as identifying evidence [42] while the body of knowledge expands day by day [43]. Following Webster and Watson [44], as well vom Brocke et al. [42, 45], our literature review comprises four steps: (1) We focused on leading IS, selected business, computer science, and environmental journals, complemented by proceedings from major IS conferences (*outlet search*). (2) Accessing these outlets, we used ScienceDirect, EBSCOhost, AISEL, and the Web of Science (*database search*, Appendix Table A.1.)

To obtain an understanding of keywords, we first conducted an exploratory search. For ESG, we found synonyms, including sustainability, sustainable, environmental, green, societal, and governance. For performance management, we differentiate three areas (a) process organization, (b) organizational structure, and (c) IS. For (a) we identified process organization, MCS, and steering processes, for (b) we went for organization structure, organizational structure, organization/organizational hierarchy, risk management, and management accounting, and for (c) we decided to use information systems, green IS, environmental management information system, and its abbreviation

EMIS. To include both terms related to sustainability, we implemented “sustainab\*” in our search string, and for the same reason “organization\*.”

Excluding unrelated work, we implemented “societal,” and not “social” to avoid publications in the field of social media. The same applies to the abbreviation “IS” due to the ambiguity of the identically spelled verb. The final search string combines the ESG domain with performance management, using the Boolean Operator “AND.” Within these umbrella areas, all aforementioned keywords are considered for the search with the Boolean Operator “OR” (Figure 1, top).

(3) Applying this strategy (*keyword search*) in April 2023, we initially found a total number of 1.093 publications – limited to the last ten years, but across all publication media (Figure 1, middle). We then performed data cleansing and removed 212 duplicates as well as eight publications with incorrect data (e.g., missing titles/authors/journals). With a title search, we reduced the 873 publications to 258, by searching for a combination of ESG concepts for companies focusing on the process organization, organizational structure, or in combination with IS. We continued to read the abstracts in a similar manner (abstract search) and then identified 137 papers. Our full-text search yielded 57 relevant publications. (4) Finally, we conducted a *backward and forward-search* and identified another seven publications. We ended up with *64 publications in total* (Figure 1, bottom). To avoid bias, the title, abstract, and full-text search were conducted by two researchers independently. After completing each step, they compared and discussed their results until they reached a consensus. Figure 1 depicts the results of our search process.

Search Term		
Umbrella term	Sub-category	Keywords used for the database search
ESG	1. ESG	("Sustainab*" OR "Environmental" OR "Green" OR "Societal" OR "Governance")
AND	AND	AND
Performance management	2. Performance Management	("Performance Management" OR
	2.a) Process organization	"Process organization" OR "Management control system" OR "Steering process" OR
	2.b) Organizational structure	"Organization" structure" OR "Organization" hierarchy" OR "Risk management" OR "Management accounting" OR
	2.c) Information system	"Information systems" OR "Green IS" OR "Environmental Management Information System" OR "EMIS")

↓

Databases	
Database (incl. covered journals)	Publications found (limited to the last ten years)
AISeLibrary (AMCIS, ECIS, ICIS, JAIS, MISQ, PACIS)	541
EBSCOhost (EJIS, ISJ, ISR, JIT, JIMIS)	+ 180
ScienceDirect (DSS, JSIS)	+ 45
Web of Science (TOP 50 Scimago from Business, Computer Science and Environmental Science)	+ 327
<b>Total</b>	<b>= 1.093</b>

↓

Results		
Process steps	Change in publications	Relevant publications
Initial number of publications		1.093
Data Cleansing (removing duplicates or incomplete data)	- 220	873
Title search	- 615	258
Abstract search	- 121	137
Full text search	- 80	57
Forward / Backward search	+ 7	64
<b>Unique dataset for our SLR</b>		<b>= 64</b>

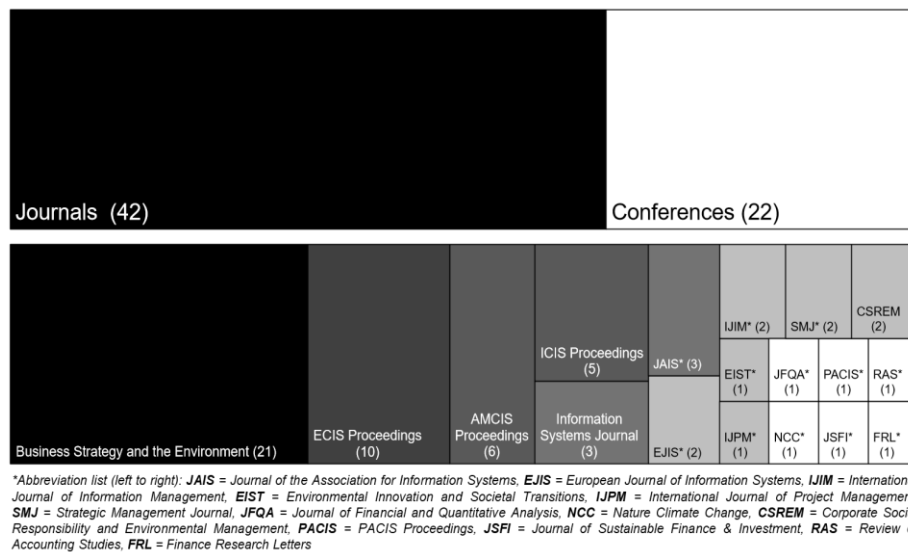
**Fig. 1.** Process applied in our literature review.

## 4 Results

In this section, we provide the descriptive statistics of our selected 64 publications. We then classify the latter, and by exposing underrepresented areas, we suggest ten take-aways that cover main themes, research gaps, and avenues of future research.

### 4.1 Descriptive results

Analyzing the metrics of our data set, we condense a first finding regarding the importance of ESG performance management in general. The 64 relevant publications (Sect. 3) encompass 42 top-journal articles and twenty-two conference proceedings (Figure 2, top). We found twenty-one publications in the “Business Strategy and the Environment” journal, followed by ECIS proceedings with ten publications, AMCIS with six, and ICIS proceedings with five hits. Other journals follow with a smaller number of articles. This is an indication regarding the importance of ESG performance management at least in Europe, as the “Business Strategy and the Environment” journal is a top-tier UK-based journal. ICIS, ECIS, and AMCIS, in turn, are the most important conferences for IS researchers [47].

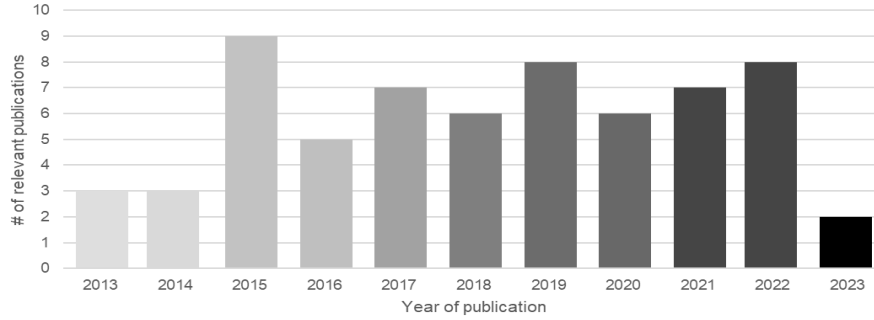


**Fig. 2.** Article's distribution among different journals and proceedings.

Examining the publication years, we observed a significant increase in 2015 – the year of the SDGs presentation by the UN. In detail, we recognized an increase from three to nine articles from 2014 to 2015, followed by a drop to five publications in 2016. This decline appears high, but the relevant publications in 2016 form a plateau that is still higher than in the years before 2015. Since then, the topic has retained its importance until 2022, with eight papers (Figure 3). As we conducted our literature review in April 2023, it is not surprising that for this year, the number of publications is low.



*Takeaway 1: ESG performance management is an emerging topic in the literature. It gained momentum since the presentation of the UN's SDGs in 2015.*



**Fig. 3.** Paper distribution over time.

## 4.2 Critical appraisal

Classifying the literature according to the dimensions and focus areas of the TOE framework (Sect. 2.4), Figure 4 depicts our results. **(1) Technology** – we set four focus areas as follows. Regarding the (1a) *types of application*, most publications examine stand-alone applications, dedicated to one purpose or task. They are cloud- or on-premise solutions and in some companies, they are simple repositories for centrally storing and managing ESG data [40]. Furthermore, we found publications examining extensions beyond other purposes, e.g., ERPs, which store ESG data in addition to other data areas. The last application type is manual solutions, which covers spreadsheets or spreadsheet-based tools.

While stand-alone applications leverage automation, manual solutions lead to manual processes which are often inefficient. Stand-alone solutions offer advantages such as specialization or customized interfaces, which can be used for gathering and consolidating data, e.g., for a company's ESG disclosure. However, they typically lack connectivity with other IS within a company. Studies have elaborated on this shortcoming, which often covers poor data quality, availability, and data democratization [7; 40; 48–50]. Poor data quality entails inconsistencies, wrong assignments, or unstructured data. However, if IS are correctly integrated, they bear the potential for detailed analysis to improve business processes or resource allocation beyond compliance objectives [51]. We summarize our findings in a second takeaway.

*Takeaway #2: To overcome shortcomings such as poor data quality, availability, and democratization, stand-alone solutions should be integrated into a company's IS architecture – especially to leverage detailed analysis for business improvement.*

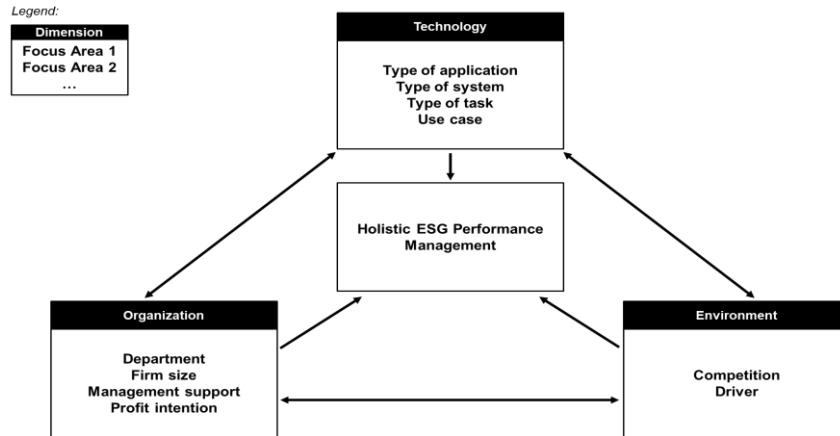
For the (1b) *type of system*, we found a mix of belief, diagnostic control, and interactive control systems. Belief systems address mental concepts and personal behaviors, such as the decision to implement responsible innovation [52], circular economy practices [53], or pro-environmental behavior [7; 54]. Diagnostic control systems are dominant

for automating and data presentation [49; 55], covering comprehensive analysis, decision-making, and strategy planning. In contrast, interactive control systems to transform the strategy of a company into action barely exist [7]. Consequently, we conclude.

*Takeaway 3: The most frequent IS types for ESG performance reporting are diagnostic control systems. Interactive control systems are still rare to transform a company's vision, mission, and strategic program into action to achieve business value.*

Focusing on the (1c) *type of task*, companies use sustainable IS to automate, inform, or transform data [42]. Data visualization can help to break down complex concepts and reveal information flows [53]. In turn, tracking, often referred to as monitoring, is the main reason for IS adoption [40; 56; 57]. More sophisticated IS concepts combine data to provide advice and assign themselves to decision support systems [58; 59]. Transforming IS has the potential to disrupt the current way of work and business models. Stringent company-wide changes are rare by nature. However, there are calls to include existing state-of-the-art, transformative technologies, such as predictive analytics, for ESG data [60]. Accordingly, our third takeaway is as follows.

*Takeaway 4: Most IS focus on automation and data presentation. Transformative technologies such as predictive analytics for ESG performance reporting are currently not elaborated in the literature.*



**Fig. 4.** TOE framework, including set focus areas (based on Tornatzky et al. [37]).

With a focus on specific (1d) *use cases*, some companies use sustainable IS for preparing the ESG disclosure [40; 61]. Other companies examined IS adoption [50; 58]. Two nuances of use cases were salient: Green supply chain management and case optimizations. On the one hand, as the supply chain is accountable for a fair share of a company's externalities, it seems logical to enhance this field in studies [49; 53; 57; 62; 63]. On the other hand, some studies performed single case optimizations, e.g., eco-innovations [5], electric grids [64], eco-effectiveness [56], and decision-making in the energy sector [65]. These cases are operational, while we only found some publications

examining green strategies, which again were not embedded in an overarching framework [7]. Accordingly, our last takeaway for the technology dimension states as follows:

*Takeaway 5: The dominant use cases for ESG performance management cover operational topics, while sustainable strategies are still lacking.*

**(2) Organization** – we adopted four organizational focus areas from the literature, which are department, firm size, management support, and profit intention (Sect. 2). Regarding the (2a) *department*, which should drive a company’s ESG performance management, Watson et al. [64] as well as Sadok and Welch [66] suggested a centralized approach in the management accounting department. Other authors reported on self-empowered management for decision-making regarding ESG initiatives [54; 67–69] or assigned “managing chances and risks” as the core capability of the risk management department [70–73]. Others suggest the executive board as the driver for sustainability [74–77]. We suggest that each company needs to clarify, which department should drive the ESG performance management. In doing so, it is more important to align ESG strategies with important stakeholders [78], leverage existing processes and IS knowledge [79], and finally adapt to cope with complex issues in a data-driven manner [64; 75]. We derive a sixth takeaway.

*Takeaway 6: ESG strategies need to be clearly communicated across departments. They combine human expertise with IS functionalities to be successful in the long run.*

We found some publications examining different (2b) *firm sizes*. From micro companies to SMEs, and groups, all sizes were present. We did not find studies indicating a relationship between firm size and its ESG performance. We only observed mediating influences. So, some studies examined the influence of female board members with regard to a company’s sustainability performance. Other studies found that heterogeneous boards lead to more socially sustainable initiatives within a company [74]. One explanation is that female managers and directors recognize greater value in external relationships [67] that are strengthened by corporate philanthropy [80]. Shahab et al. [74] indicated that different constellations of top management teams (TMT) influence the link between environmental performance and financial distress. In particular, the presence of TMT minorities (e.g., females) contributes to environmental performance, which, in turn, reduces the risk of financial distress. Consequently, we conclude:

*Takeaway 7: Company size is used as a control variable. However, by focusing on management board constellations, gender influence is a current theme in the socially sustainable literature. However, there is a need for more factors to be examined than genders, such as ethnicity, or religion.*

(2c) We identified *management support* as a key driver for sustainable strategies and their operationalization, i.e., behavior and culture [5; 57; 64; 79]. As the economic perspective is crucial for performance, there is a significant interdependency between management support and (2d) *profit intention*, so we combine these findings. Even if sustainable initiatives are identified and discussed, these projects often fail and lead to low or even negative profitability, if they lack management commitment [68]. The management has to put green strategies on the overarching agenda and consciously integrate them into the day-to-day operations to translate strategy into action. [40; 75].

Full integration in a company comprises not only execution, and tracking KPIs, but also regularly reviewing the outcomes of sustainable acting in an end-to-end process to leverage its potential for business value. Sustainable strategies often start with compliance topics as a necessity to avoid penalties. However, more and more managers recognize these initiatives as having the potential also to drive further business improvements beyond compliance. The outcomes of these initiatives can increase reputation, attract investors, and eventually be a market differentiator [81; 82]. These mechanisms help to deliver business value whilst promoting sustainability. While the literature is still expanding on this topic, this relation has already been shown to hold for various countries or regions [83–85]. If sustainable strategies are to be successful, they need to be backed by executive management to finally highlight the importance to the entire company (signaling effect) [50; 76; 86]. Thus, we come up with our eighth takeaway.

*Takeaway 8: The management should not only identify and promote sustainable initiatives as useful. It needs to integrate them into the company's vision, mission, and strategic program and commit them to realizing both the highest economic and sustainable output beyond compliance.*

**(3) Environment** – covering the communication with stakeholders, we found two focus areas, which comprise the influence of competition on and drivers for ESG performance reporting. Focusing on the (3a) *competition*, most firms merely want to comply with requirements as they treat ESG performance reporting as a risk [61; 71] and elaborate on mitigating this risk to avoid fines and penalties. In turn, other companies embed ESG in their sustainability strategies as they see ESG as a differentiator in the market. Three studies indicate that this might be a promising strategy [77; 86; 87]. However, studies also conclude twofold: (1) Voluntary ESG disclosure has positive effects on a company's performance and reputation [77; 88; 89]; but (2) most of the companies report voluntarily, as they expect that regulation will be a “must” in future, and so they already prepare for it. We conclude as follows.

*Takeaway 9: Companies align their reporting with current ESG standards to prepare for future regulations. However, they should not only comply with the regulations but leverage their ESG performance reporting as a differentiator in order to gain a competitive advantage.*

Examining the (3b) *driver* of ESG performance management, we found evidence that the lion's share of companies voluntarily discloses their sustainability performance. They align with current standards such as GRI [63], CDP [59], and UNGC [50]. On top of that the EU finalized their adjustments of ESRS (Section 2.3.) which will be effective by 2025. The ESRS will operationalize the CSRD and thus will be the dominant and seminal standard for companies in the EU [90]. This affects European regulation and disclosure of ESG performance massively. We conclude our last takeaway as follows:

*Takeaway 10: Out of a variety of ESG disclosure standards, the finalized ESRS, operationalizing the CSRD, will be the dominant standard in Europe. Consequently, many European companies will have to align with the ESRS in the future.*

We classified relevant publications in the TOE framework and discovered another two observations of interest. Firstly, the distribution of publications between the three TOE

dimensions was roughly equal. As some publications cover more than a single dimension, we assessed them as not mutually exclusive and assigned them to more than one dimension when needed. Secondly, we examined three publications that comprehensively handled ESG performance management. However, none of them presented a holistic framework that covers all categories from prior publications. Our findings are depicted in Figure 5.

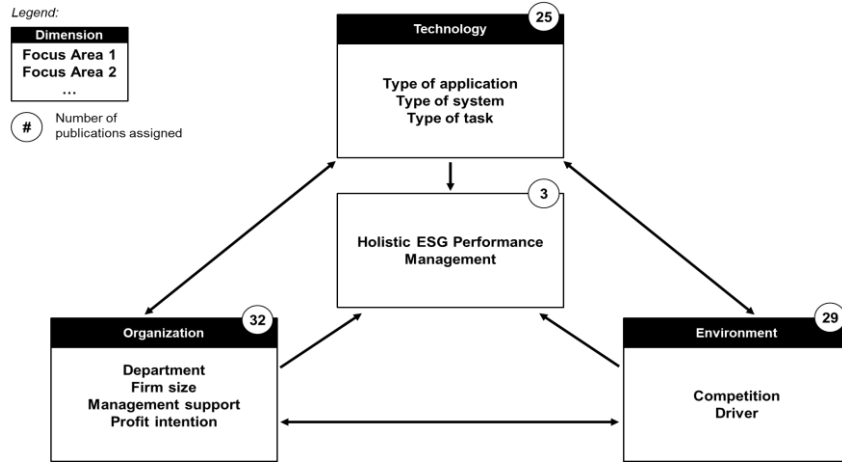


Fig. 5. Publications of our literature review assigned to the TOE framework.

## 5 Discussion and Conclusion

The objective of this article was to present *findings from a literature review focusing on a company's (internal) ESG performance management leveraging IS*. By applying the TOE framework, we consolidated the current ESG literature threefold in terms of (1) structural and (2) process organization, as well as (3) supporting IS. We finally provided ten takeaways which cover main themes, research gaps, and avenues of future research.

With regard to the *main themes* for ESG performance management, the literature still elaborates on the operational set-up and the measurement of successful ESG initiatives. Compared to prior studies, we examined the tendency that the main focus is on the environmental dimension “E,” followed by “S,” and “G” (Appendix Table A.3). While the accounting literature focuses on ESG vision, mission, and strategic program implementation, heterogeneous board structures and the ESG disclosure reception by capital markets, the IS community focuses more on single case optimizations, alternative IS solutions, and mechanism for fostering sustainable behavior.

The main *research gap* that became apparent in our literature review is the missing link between ESG vision, mission, and strategic program and operations, in other words translating ESG strategy into action. Accordingly, *avenues of further research* include

adopting interactive control systems and advanced analytics in a company's ESG performance management and ultimately a framework for ESG performance management in general.

Furthermore, current ESG performance management typically entails stand-alone applications that should be integrated into a company-wide (more holistic) IS architecture. Applications are currently used for automation and information tasks, so they gather, load, and monitor data for decision-making on an operational, but not on a strategic level aiming to transform the business. Fostering a more sustainable mindset and behavior, this is an opportunity to apply ESG reporting standards beyond pure compliance fulfillment and position that as a differentiator in the market by leveraging internal strength. In doing so, we have not just added a new perspective on how to use the TOE framework but started a *new research stream*.

However, our research is associated with certain *limitations*, which open up avenues for future research. Firstly, we limited our work to journals and conferences from the last ten years. This might exclude certain relevant papers, which were not captured by our backward/forward search. Furthermore, one could argue that including other keywords in our search string would yield different results. Due to the number of identified publications (Sect. 2), we were not able to read all articles completely and in-depth. This may rule out some relevant publications as well. Finally, this literature review should be updated from time to time. However, the revealed research gaps should now be closed step-by-step in follow-up research work.

## References

1. Gartner: Gartner Identifies the Top 10 Strategic Technology Trends for 2023, <https://www.gartner.com/en/newsroom/press-releases/2022-10-17-gartner-identifies-the-top-10-strategic-technology-trends-for-2023>, last accessed 2024/04/15
2. European Union: Regulation (EU) 2020/852 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088. L 198/13. Official Journal of the European Union (2020)
3. European Commission: Proposal for a Directive of the European Parliament and of the Council amending Directive 2013/34/EU, Directive 2004/109/EC, Directive 2006/43/EC and Regulation (EU) No 537/2014, as regards corporate sustainability reporting (2022)
4. Nash, K., and Wakefield, R.: Examining GRI Sustainability Reports through the Lens of the Stakeholder Theory. In: Davis, G., Brown, S., Subramani, M., Allen, G. N., Joshi, K. D. and Scheibe, K. P. (eds.) *Innovative Research Informing Practice. Proceedings of the 28th AMCIS*, Minneapolis, MN, USA (2022)
5. Hanelt, A., Busse, S., and Kolbe, L. M.: Driving business transformation toward sustainability: exploring the impact of supporting IS on the performance contribution of eco-innovations. *Information Systems Journal*, **27**(4), 463-502 (2017)
6. Lardo, A., Corsi, K., Varma, A., and Mancini, D.: Exploring blockchain in the accounting domain: a bibliometric analysis. *Accounting, Auditing & Accountability Journal*, **35**(9), 204-233 (2022)

7. Henkel, C., Seidler, A.-R., Kranz, J., and Fiedler, M.: How to become a Sustainability Leader? The Role of IS Affordances in Enabling and Triggering Sustainability Transformations. In: Kim, Y. J., Agarwal, R. and Lee, J. K. (eds.) *Transforming Society with Digital Innovation*. Proceedings of the 37th ICIS, Seoul, South Korea (2017)
8. Tsang, A., Frost, T., and Cao, H.: Environmental, Social, and Governance (ESG) disclosure: A literature review. *The British Accounting Review*, **55**(101149), 1-21 (2023)
9. Gillan, S. L., Koch, A., and Starks, L. T.: Firms and social responsibility: A review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*, **66**(101889), 1-16 (2021)
10. Lombardi, R., and Secundo, G.: The digital transformation of corporate reporting – a systematic literature review and avenues for future research. *Meditari Accountancy Research*, **29**(5), 1179-1208 (2021)
11. Ambec, S., and Lanoie, P.: Does It Pay to Be Green? A Systematic Overview. *Academy of Management Perspectives*, **22**(4), 45-62 (2008)
12. Schoormann, T., Strobel, G., Möller, F., Petrik, D., and Zschech, P.: Artificial Intelligence for Sustainability—A Systematic Review of Information Systems Literature. *Communications of the Association for Information Systems*, **52**(1), 199-237 (2023)
13. Henkel, C., and Kranz, J.: Pro-Environmental Behavior and Green Information Systems Research - Review, Synthesis and Directions for Future Research. In: Pries-Heje, J., Ram, S. and Rosemann, M. (eds.) *Transforming Society with Digital Innovation*. Proceedings of the 39th ICIS, San Francisco, CA, USA (2018)
14. Harnischmacher, C., Herrenkind, B., and Weibier, L.: Yesterday, Today, and Tomorrow - Perspectives on Green Information Systems Research Streams. In: Rowe, F., El Amrani, R., Limayem, M., Newell, S., Pouloudi, N., van Heck, E. and El Quammah, A. (eds.) *Liberty, Equality, and Fraternity in a Digitizing World*. Proceedings of the 28th ECIS, Marrakech, Morocco (2020)
15. Arvidsson, S., and Dumay, J.: Corporate ESG reporting quantity, quality and performance: Where to now for environmental policy and practice? *Business Strategy and the Environment*, **31**(3), 1091-1110 (2022)
16. Bandara, W., Furtmueller, E., Gorbacheva, E., Miskon, S., and Beekhuyzen, J.: Achieving Rigor in Literature Reviews: Insights from Qualitative Data Analysis and Tool-Support. *Communications of the Association for Information Systems*, **37**(8), 154-204 (2015)
17. Ahmadifar, T. M., and Williamson, G. A.: ESG Investing Frameworks and SEC Regulation. *The Investment Lawyer*, **29**(7), 3-15 (2022)
18. United Nations: About the PRI, <https://www.unpri.org/about-us/about-the-pri>, last accessed 2024/04/15
19. United Nations: Transforming our world: The 2030 agenda for sustainable development, <https://sdgs.un.org/sites/default/files/publications/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>, last accessed 2024/04/15
20. United Nations Global Compact: Our Ambition, <https://unglobalcompact.org/what-is-gc/mission>, last accessed 2024/04/15
21. EFRAG: First Set of draft ESRS, <https://www.efrag.org/lab6>, last accessed 2024/04/15

22. ISSB: February 2023 ISSB Update and podcast now available, <https://www.ifrs.org/news-and-events/news/2023/02/february-2023-issb-update-and-podcast-now-available/>, last accessed 2024/04/15
23. Ketter, W., Padmanabhan, B., Pant, G., and Raghu, T. S.: Special Issue Editorial: Addressing Societal Challenges through Analytics: An ESG ICE Framework and Research Agenda. *Journal of the Association for Information Systems*, **21**(5), 1115-1127 (2020)
24. Committee of Sponsoring Organizations of the Treadway Commission: Achieving effective internal control over sustainability reporting (ICSR): Building Trust and Confidence through the COSO Internal Control-Integrated Framework, <https://www.imanet.org/research-publications/ima-reports/coso>, last accessed 2024/04/14
25. Swain, M. R., and Fawcett, S. E.: Activity-based costing. In: Swamidass, P. M. (ed.). *Encyclopedia of production and manufacturing management*, pp. 10–19. Springer US, New York (2006)
26. Turney, P. B. B.: Activity-Based Management. *Management Accounting*, **10**(2), 375-382 (1992)
27. Copeland, T. E., Koller, T., and Murrin, J.: *Valuation: measuring and managing the value of companies*. 9th print. John Wiley, New York, NY (1991)
28. Simons, R.: *Levers of control: How managers use innovative control systems to drive strategic renewal*. Harvard Business Press, Boston, MA (1995)
29. Simons, R.: *Performance measurement & control systems for implementing strategy*. Prentice Hall, Upper Saddle River, NJ (2000)
30. Mundy, J.: Creating dynamic tensions through a balanced use of management control systems. *Accounting, Organizations and Society*, **35**(5), 499-523 (2010)
31. Baird, K., Su, S., and Munir, R.: Levers of control, management innovation and organisational performance. *Pacific Accounting Review*, **31**(3), 358-375 (2019)
32. Journeault, M., Rongé, Y. de, and Henri, J.-F.: Levers of eco-control and competitive environmental strategy. *The British Accounting Review*, **48**(3), 316-340 (2016)
33. Widener, S. K.: An empirical analysis of the levers of control framework. *Accounting, Organizations and Society*, **32**(7-8), 757-788 (2007)
34. Kaplan, R. S., and Norton, D. P.: The Balanced Scorecard: Measures that Drive Performance. *Harvard Business Review*, **36**(1), Art. 9 (1992)
35. Epstein, M. J., and Wisner, P. S.: Using a Balanced Scorecard to Implement Sustainability. *Environmental Quality Management*, **11**(2), 1-10 (2001)
36. Schaltegger, S., and Wagner, M.: Integrative management of sustainability performance, measurement and reporting. *International Journal of Accounting, Auditing and Performance Evaluation*, **3**(1), 1-19 (2006)
37. Tornatzky, L. G., Fleischer, M., and Chakrabarti, A. K.: *The processes of technological innovation*. Lexington Books, Lexington, MA (1990)
38. Bryan, J. D., and Zuva, T.: A Review on TAM and TOE Framework Progression and How These Models Integrate. *Advances in Science, Technology and Engineering Systems Journal*, **6**(3), 137-145 (2021)
39. Etzion, D., and Aragon-Correa, J. A.: Big Data, Management, and Sustainability. *Organization & Environment*, **29**(2), 147-155 (2016)



40. Seethamraju, R. C., and Frost, G.: Deployment of Information Systems for Sustainability Reporting and Performance. In: Proceedings of the 25th AMCIS, Cancún, Mexico
41. Nguyen, T. H., Le, X. C., and Vu, T. H. L.: An Extended Technology-Organization-Environment (TOE) Framework for Online Retailing Utilization in Digital Transformation: Empirical Evidence from Vietnam. *Journal of Open Innovation: Technology, Market, and Complexity*, **8**(4), Art. 200 (2022)
42. Chen, A. J., Boudreau, M.-C., and Watson, R. T.: Information systems and ecological sustainability. *Journal of Systems and Information Technology*, **10**(3), 186-201 (2008)
43. Zopounidis, C., Garefalakis, A., Lemonakis, C., and Passas, I.: Environmental, social and corporate governance framework for corporate disclosure: a multicriteria dimension analysis approach. *Management Decision*, **58**(11), 2473-2496 (2020)
44. Loeser, F., Recker, J., vom Brocke, J., Molla, A., and Zarnekow, R.: How IT executives create organizational benefits by translating environmental strategies into Green IS initiatives. *Information Systems Journal*, **27**(4), 503-553 (2017)
45. Linnenluecke, M. K.: Environmental, social and governance (ESG) performance in the context of multinational business research. *Multinational Business Review*, **30**(1), 1-16 (2022)
46. Global Reporting Initiative: GRI Standards, <https://www.globalreporting.org/how-to-use-the-gri-standards/gri-standards-english-language/>, last accessed 2024/04/15
47. AIS: AIS Conferences, <https://aisel.aisnet.org/conferences/>, last accessed 2024/04/14
48. Shekarian, N., and Ramirez, R.: The Impact of Corporate Sustainability and Technology Investment on Firm Innovation. In: Davis, G., Brown, S., Subramani, M., Allen, G. N., Joshi, K. D. and Scheibe, K. P. (eds.) *Innovative Research Informing Practice. Proceedings of the 28th AMCIS, Minneapolis, MN, USA* (2022)
49. Zampou, E., Karagiannaki, A., and Pramatar, K.: Implementation Of Energy And Carbon Management Systems In The Supply Chain: Evidence From The Retail And Consumer Goods Industries. In: Proceedings of the 24th ECIS, Istanbul, Turkey (2016)
50. Hoang, G., Molla, A., and Poon, P. L.: Factors Influencing The Adoption Of Environmental Enterprise Systems. In: Wei, K. K., Huang, W. W., Lee, J. K., Xu, D., Jiang, J. J. and Kim, H.-W. (eds.) *Proceedings of the 23rd PACIS, X'ian, China* (2019)
51. Mervelskemper, L., and Streit, D.: Enhancing Market Valuation of ESG Performance: Is Integrated Reporting Keeping its Promise? *Business Strategy and the Environment*, **26**(4), 536-549 (2017)
52. Cherki El Idrissi, S., Corbett, J., and Mellouli, S.: Exploratory Study of Responsible Innovation: Toward a Holistic Approach to Sustainability. In: Anderson, B. B., Thatcher, J., Meservy, R. D., Chudoba, K., Fadel, K. J. and Brown, S. (eds.) *Proceedings of the 26th AMCIS, Virtual Conference* (2020)
53. Zeis, R.: Information Flows In Circular Economy Practices. In: vom Brocke, J., Gregor, S. and Müller, O. (eds.) *Information Systems for a Sharing Society. Proceedings of the 27th ECIS, Stockholm, Sweden* (2019)
54. Seidler, A.-R., Henkel, C., Fiedler, M., and Kranz, J.: Encouraging Pro-Environmental Behaviour: Affordances and Institutional Logics in IS-enabled Organisational Sustainability Transformations. In: Bednar, P. M., Frank, U. and Kautz, K. (eds.) *Beyond Digitization - Facets of Socio-Technical Change. Proceedings of the 26th ECIS, Portsmouth, UK* (2018)

55. Fridgen, G., Saumweber, A., Seyfried, J., and Wederhake, L.: Decision Flexibility vs. Information Accuracy in Energy-intensive Businesses. In: Bednar, P. M., Frank, U. and Kautz, K. (eds.) *Beyond Digitization - Facets of Socio-Technical Change*. Proceedings of the 26th ECIS, Portsmouth, UK (2018)
56. Seidel, S., Székely, N., and vom Brocke, J.: Green IS: Are We Still Thinking in Mere Economic Imperatives or Are We Striving for Eco-Effectiveness? In: *Proceedings of the 21st AMCIS, Puerto Rico* (2015)
57. Centobelli, P., Cerchione, R., Esposito, E., and Shashi: Evaluating environmental sustainability strategies in freight transport and logistics industry. *Business Strategy and the Environment*, **29**(3), 1563-1574 (2020)
58. Hilpert, H., Kranz, J., and Schumann, M.: An information system design theory for green information systems for sustainability reporting - integrating theory with evidence from multiple case studies. In: Avital, M., Leimeister, J. M. and Schultze, U. (eds.) *Proceedings of the 22nd ECIS, Tel Aviv, Israel* (2014)
59. Corbett, J.: Designing and Using Carbon Management Systems to Promote Ecologically Responsible Behaviors. *Journal of the Association for Information Systems*, **14**(7), 339-378 (2013)
60. Pan, S. L., Carter, L., Tim, Y., and Sandeep, M. S.: Digital sustainability, climate change, and information systems solutions: Opportunities for future research. *International Journal of Information Management*, **63**(102444), 1-5 (2022)
61. Seethamraju, R., and Frost, G.: Information Systems for Sustainability Reporting - A State of Practice. In: *Proceedings of the 23rd AMCIS, San Diego, CA, USA* (2016)
62. Zampou, E., Pramataris, K., and Mourtos, I.: Design of Environmental Performance Monitoring Systems in the Supply Chain: The Role of Interoperability. In: Becker, J., vom Brocke, J. and Marco, M. de (eds.) *Proceedings of the 23rd ECIS, Münster, Germany* (2015)
63. Zampou, E., Mourtos, I., Pramataris, K., and Seidel, S.: A Design Theory for Energy and Carbon Management Systems in the Supply Chain. *Journal of the Association for Information Systems*, **23**(1), 329-371 (2022)
64. Watson, R. T., Ketter, W., Recker, J., and Seidel, S.: Sustainable Energy Transition: Intermittency Policy Based on Digital Mirror Actions. *Journal of the Association for Information Systems*, **23**(3), 631-638 (2022)
65. Nuss, C.: Developing an Environmental Management Information System to Foster Sustainable Decision-Making in the Energy Sector. In: Becker, J., vom Brocke, J. and Marco, M. de (eds.) *Proceedings of the 23rd ECIS, Münster, Germany* (2015)
66. Sadok, M., and Welch, C.: A Socio-Technical Approach To Sustainability In Organizations: An Exploratory Study. In: Ramos, I., Tuunainen, V. and Kremer, H. (eds.) *Proceedings of the 25th ECIS, Guimarães, Portugal* (2017)
67. Yang, M. X., Li, J., Yu, I. Y., Zeng, K. J., and Sun, J.-M.: Environmentally sustainable or economically sustainable? The effect of Chinese manufacturing firms' corporate sustainable strategy on their green performances. *Business Strategy and the Environment*, **28**(6), 989-997 (2019)
68. Marnewick, C.: Information system project's sustainability capability levels. *International Journal of Project Management*, **35**(6), 1151-1166 (2017)

69. Goggins, G., and Rau, H.: Alteration spaces: Charting the sustainability potential of large organizations. *Environmental Innovation and Societal Transitions*, **40**, 435-449 (2021)
70. Reshad, A. I., Biswas, T., Agarwal, R., Paul, S. K., and Azeem, A.: Evaluating barriers and strategies to sustainable supply chain risk management in the context of an emerging economy. *Business Strategy and the Environment*, **32**(7), 4315-4334 (2023)
71. Goldstein, A., Turner, W. R., Gladstone, J., and Hole, D. G.: The private sector's climate change risk and adaptation blind spots. *Nature Climate Change*, **9**(1), 18-25 (2019)
72. Xue, B., Zhang, Z., and Li, P.: Corporate environmental performance, environmental management and firm risk. *Business Strategy and the Environment*, **29**(3), 1074-1096 (2020)
73. Ethirajan, M., Arasu M, T., Kandasamy, J., K.E.K, V., Nadeem, S. P., and Kumar, A.: Analysing the risks of adopting circular economy initiatives in manufacturing supply chains. *Business Strategy and the Environment*, **30**(1), 204-236 (2021)
74. Shahab, Y., Ntim, C. G., Chengang, Y., Ullah, F., and Fosu, S.: Environmental policy, environmental performance, and financial distress in China: Do top management team characteristics matter? *Business Strategy and the Environment*, **27**(8), 1635-1652 (2018)
75. Hristov, I., Appolloni, A., and Chirico, A.: The adoption of the key performance indicators to integrate sustainability in the business strategy: A novel five-dimensional framework. *Business Strategy and the Environment*, **31**(7), 3216-3230 (2022)
76. Chan, R. Y. K.: Do chief information officers matter for sustainable development? Impact of their regulatory focus on green information technology strategies and corporate performance. *Business Strategy and the Environment*, **30**(5), 2523-2534 (2021)
77. Stadler, L., and Lin, H.: Moving to the Next Strategy Stage: Examining Firms' Awareness, Motivation and Capability Drivers in Environmental Alliances. *Business Strategy and the Environment*, **26**(6), 709-730 (2017)
78. Seidel, S., Chandra Kruse, L., Székely, N., Gau, M., and Stieger, D.: Design principles for sensemaking support systems in environmental sustainability transformations. *European Journal of Information Systems*, **27**(2), 221-247 (2018)
79. Wang, Y., Chen, Y., and Benitez-Amado, J.: How information technology influences environmental performance: Empirical evidence from China. *International Journal of Information Management*, **35**(2), 160-170 (2015)
80. Marquis, C., and Lee, M.: Who is governing whom? Executives, governance, and the structure of generosity in large U.S. firms. *Strategic Management Journal*, **34**(4), 483-497 (2013)
81. Martin, P. R., and Moser, D. V.: Managers' green investment disclosures and investors' reaction. *Journal of Accounting and Economics*, **61**(1), 239-254 (2016)
82. Fatemi, A., Glaum, M., and Kaiser, S.: ESG performance and firm value: The moderating role of disclosure. *Global Finance Journal*, **38**, 45-64 (2018)
83. Ademi, B., and Klungseth, N. J.: Does it pay to deliver superior ESG performance? Evidence from US S&P 500 companies. *Journal of Global Responsibility*, **13**(4), 421-449 (2022)
84. Yoon, B., Lee, J., and Byun, R.: Does ESG Performance Enhance Firm Value? Evidence from Korea. *Sustainability*, **10**(10), 1-18 (2018)
85. Velte, P.: Does ESG performance have an impact on financial performance? Evidence from Germany. *Journal of Global Responsibility*, **8**(2), 169-178 (2017)

86. Walker, K., Ni, N., and Dyck, B.: Recipes for Successful Sustainability: Empirical Organizational Configurations for Strong Corporate Environmental Performance. *Business Strategy and the Environment*, **24**(1), 40-57 (2015)
87. Zhou, Z., Zhang, L., Lin, L., Zeng, H., and Chen, X.: Carbon risk management and corporate competitive advantages: “Differential promotion” or “cost hindrance”? *Business Strategy and the Environment*, **29**(4), 1764-1784 (2020)
88. Ben-Amar, W., and McIlkenny, P.: Board Effectiveness and the Voluntary Disclosure of Climate Change Information. *Business Strategy and the Environment*, **24**(8), 704-719 (2015)
89. Sinnewe, E., Yao, T., and Zaman, M.: Informing or obfuscating stakeholders: Integrated reporting and the information environment. *Business Strategy and the Environment*, **30**(8), 3893-3906 (2021)
90. European Commission: The Commission adopts the European Sustainability Reporting Standards, [https://finance.ec.europa.eu/news/commission-adopts-european-sustainability-reporting-standards-2023-07-31\\_en](https://finance.ec.europa.eu/news/commission-adopts-european-sustainability-reporting-standards-2023-07-31_en), last accessed 2024/04/15